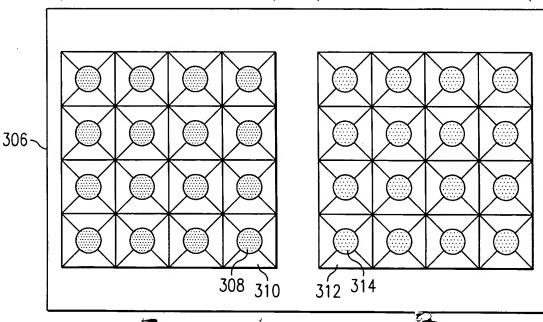
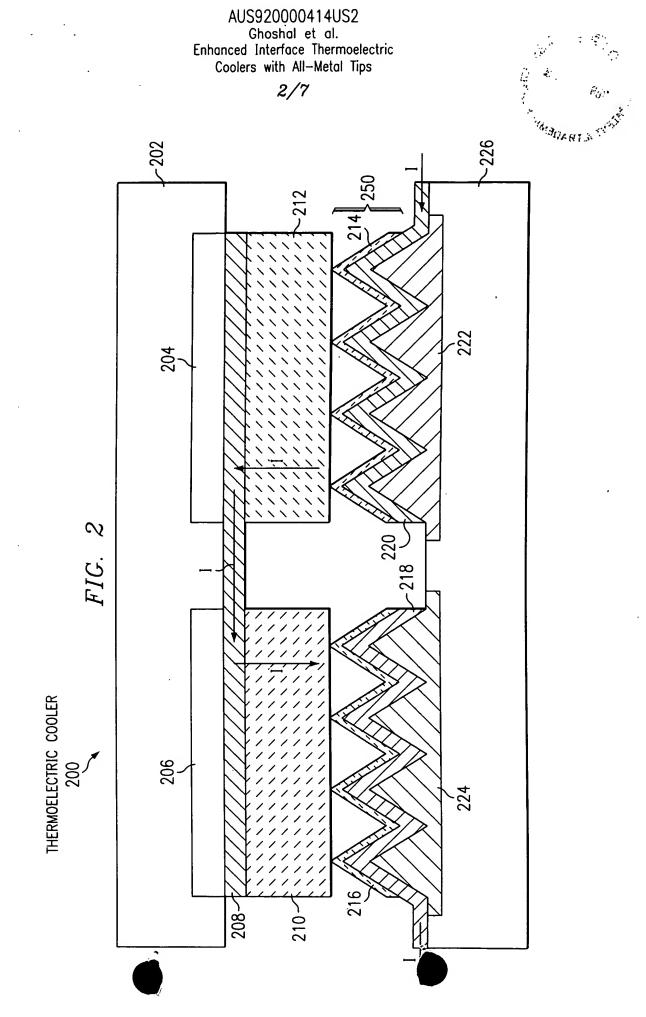
AUS920000414US2 Ghoshal et al. **Enhanced Interface Thermoelectric** Coolers with All-Metal Tips 1/7 100 <u>112</u> HEAT SOURCE -108 FIG. 1 110 (PRIOR ART) **~104** 106-114 114 108 **HEAT SINK** 116 102 POWER SOURCE 300 FIG. 3 N-TYPE P-TYPE 302 304



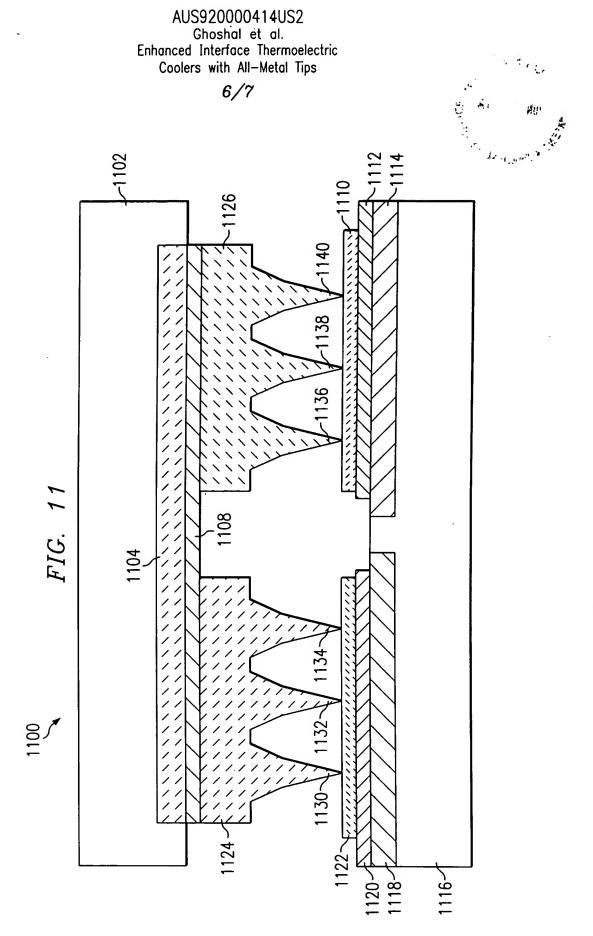


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AUS920000414US2 Ghoshal et al. Enhanced Interface Thermoelectric Coolers with All-Metal Tips 5/7 FIG. 8 FIG. 9 **BEGIN** 906 904 802 FABRICATE SILICON TIPS BY ANISOTROPIC ETCHING OF Si COAT THE SACRIFICIAL TEMPLATE 804-WITH A THIN SPUTTERED LAYER OF SEED METAL 902 806~ ELECTROCHEMICALLY DEPOSIT COPPER TO FILL THE VALLEYS FIG. 12 PLANARIZE THE TOP SURFACE 808 **BEGIN** REMOVE THE SILICON SUBSTRATE BOND OPTIMIZED SINGLE BY SELECTIVE ETCHING METHODS -1202 810-CRYSTAL MATERIALS TO METAL ELECTRODES **END** PATTERN OTHER SIDE OF -1204 THERMOELECTRIC MATERIAL FIG. 10 USING PHOTORESIST **BEGIN** ELECTROCHEMICALLY ETCH -1206 THE SURFACE PATTERN SMALL SECTIONS OF 1002~ PHOTORESIST ON PATTERNED COPPER LINKS OF THE THIN THIN A SECOND SINGLE FILM TE COOLERS CRYSTAL SUBSTRATE USING CHEMICAL-MECHANICAL **~1208 POLISHING** 1004~ DIRECTLY ETCH THE COPPER **ELECTROCHEMICALLY** ELECTROCHEMICALLY ETCH THE ENTIRE SECOND SINGLE COAT THE COPPER TIPS CRYSTAL SUBSTRATE TO WITH NICKEL **-1210** 1006-NANOMETER FILMS COAT THE NICKEL WITH AN CLAMP THE TWO ULTRA-THIN LAYER OF 1008-SUBSTRATES TOGETHER THERMOELECTRIC MATERIAL -1212

END

END



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